Our National Research Support Challenge – eResearch in Australia: NCRIS, SuperScience and Beyond

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Agreeing on Terms

.... What is eResearch?

The Australian Definition

"eResearch infrastructure comprises the information and communication technology (ICT) assets, facilities and services which support research within institutions and across national innovation systems and which contribute to the capacity of researchers to undertake excellent research and deliver innovation outcomes."

[2011 Strategic Roadmap (DIISR)]

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Some Thoughts About Research

- Research is diligent and systematic inquiry or investigation into a subject in order to discover facts or principles:
- The effectiveness of this activity depends most intimately on the rate of comprehension, which is...
- ..the capacity of the mind to understand; power to grasp ideas...
- Which....begs the question..

[Macquarie Dictionary definitions]

Seeing is Understanding

 Comprehension is at its best when our systems of perception are optimally exploited

• Or.....

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... in the words of one Al Gore

"Visualization recognizes that more than half of the human brain is devoted to processing images and that for us, visual images are the most efficient way to understand..."

Presentation to (U.S.) Senate Subcommittee on Science Technology and Space, July 1989

Seventy-Five Years of Science

From atomic fission to Higgs boson

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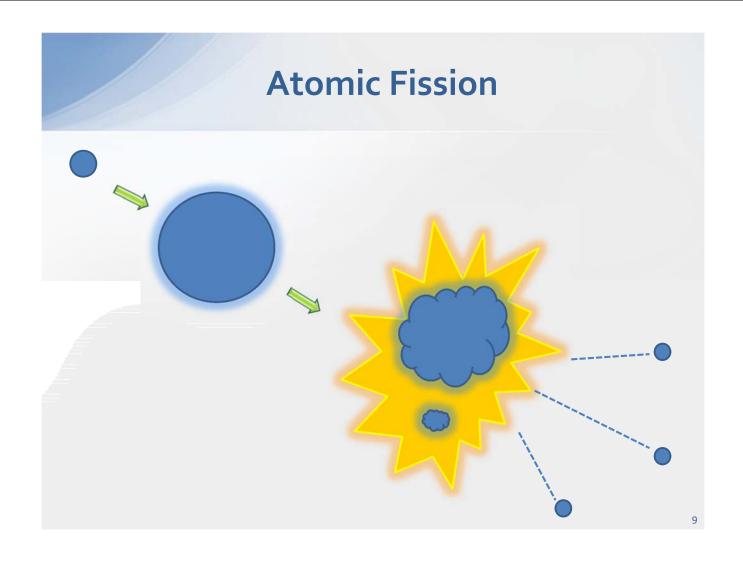
The Lise Meitner Story

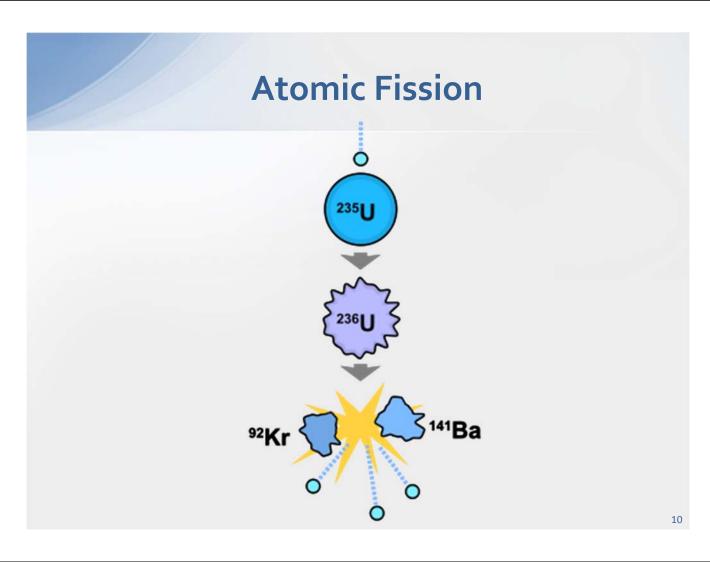


Image from Wikipedia



Aboutnuclear.org





The Write Up

ON p. 251 of this issue of NATURE, an account is given of recent investigations by Prof. O. Hahn, Prof. L. Meitner and F. Strassmann on the bombardment of uranium by neutrons.

Prof. Meitner and Dr. O. R. Frisch have discussed the development and implications of these results in a letter which also appears in this issue (p. 239).

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ie.....the first citation for this

In English, Letter to the Editors.. (one column)

Nature, 11 February 1939

The Australian Definition, Take 2

efficiency and effectiveness of research and opens up new and innovative research possibilities, across all disciplines including the ability to disseminate that knowledge".

2011 Strategic Roadmap (DIISR)

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What Gets Governments Interested?

- The prosperity infrastructure chain
- [To be prosperous a country needs a good innovation 'system' which needs active research, which needs the best infrastructure that can be deployed]

The Realpolitik of the Australian Approach

- The champion partnership, (especially in confirming the centrality of "eResearch infrastructure" within the broader concept of "infrastructure") but...
- The paymasters and the pipers

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The Australian Story

- Chronology of (national) Government Investment
 - Embedded collaborative infrastructure grants (RIBG, LIEF, MNRF) 90s +
 - APAC 2000+
 - The Systemic Infrastructure Initiative 2002+
 - NCRIS 2005-11
 - Super Science 2009+

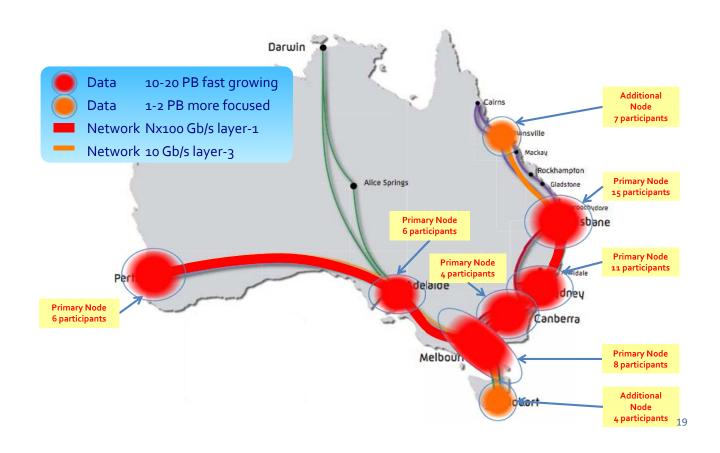
The Australian Mechanism

- Preference for direct government agreements with communities - features
 - Greater assurance of accountability
 - Generally fewer new structures with overheads, but diverse approaches (eg AuScope is a company)
 - But, depending on process, greater variability in execution, and
 - The problem of misplaced competitiveness

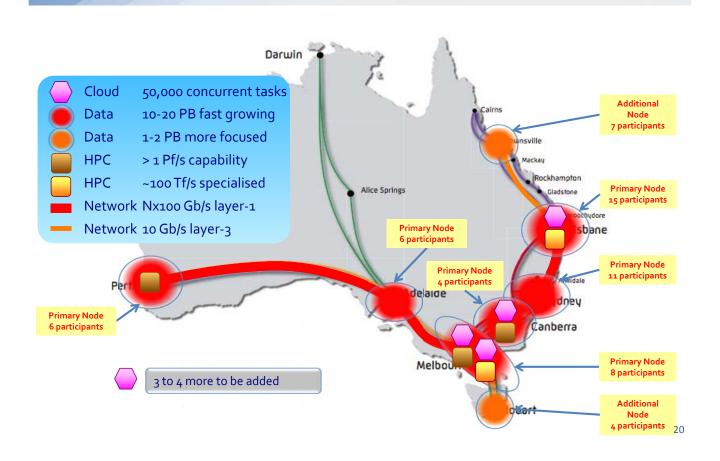
Australian National eResearch Infrastructure **Development** The next decade 2007 2013 2002 NEW Tools Infrastructure Understand requirements Support collaboration: Tools are · virtual laboratories research tools · software tools · research apps mission middleware · data sharing critical · research cloud authorisation workflow · common authorisation NEW Data Infrastructure Understand requirements Support data: Data Support the data lifecycle Data data discovery · improve data quality · capture, describe, use data use and reuse establish a corpus of explode · publish, discover, cite data publishing published research · collect, store, reuse Computation NEW Two facilities able to Sustain computational Sustain computational Systems resources at top 30 level house future supercomputers resources at top 30 level grow to Add smaller specialised NEW Install two "peta scale" exascale Develop a national grid resources, bio-data/imaging supercomputers NEW Research Network Networks Extend fibre to Perth and to fibre backbone from Adelaide to Brisbane radio astronomy facilities bandwidth high bandwidth link to the USA, Asia and Europe Increase regional access scales-up Perth, Hobart, Townsville and Darwin connected metropolitan and regional access points provided Increase metropolitan access \$182M to e-infrastructure \$82M to e-infrastructure \$312M for e-infrastructure Further from \$400M (2002-2006) from \$540M (2006-2011) from \$1100M (2009-2013) funding

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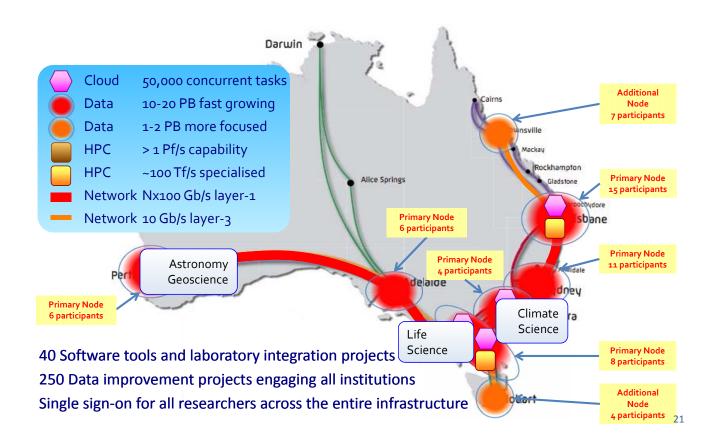
The Australian national e-infrastructure platform (2013)



The Australian national e-infrastructure platform (2013)



A national Research Data Commons of published and accessible research data



Australian e-infrastructure going forward

Continue to build towards our aims:

- Advance leading edge science and research by enabling a new order of informatics rich research tasks
- Enhance the quality and reproducibility of research by better access to reference quality data and community assured software codes
- Support world class research infrastructure by adding networks,
 computation, data and tools capabilities to other research
 infrastructure investments
- Deliver significant value to competitive and problem oriented research investments by institutions and funding agencies
- Provide substantial financial and operating efficiencies

Conclusion

National Capability



National Coherence



National Sustainability



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Discussion

